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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,737

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Hiroshi Kannan

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EXAMINER

GERIDO, DWAN A

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

11/26/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/501,737

Applicant(s)

KANNAN ET AL.

Examiner

Dwan A. Gerido, Ph.D.

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6,8,10-12,17-19 and 21-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6,8,10-12,17-19 and 21-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. For claim 8, it is unclear as to how the control means cleans inside the chamber. For the purposes of examination, any cleaning mechanism with a control means will be regarded as the control means cleaning inside the chamber.

Claim Rejections - 35 USC § 103

1. Claims 6, 17, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiyama et al (US 6,716,477).
2. With regards to claims 6 and 17, Komiyama et al., teach a process chamber (figure 23 #510), a gas supply (figure 23 #520), a first and second exhaust means (column 10 lines 11-14), a measuring means located between the first and second exhaust means (column 28 lines 36-43, figure 23 #'s 530, X4), and a control means (column 9 lines 27-34). Komiyama et al., do not explicitly teach the control means supplying a gas when the amount of a process gas is reduced to a predetermined amount. Komiyama et al., does recite the controller transmitting an open-close signal to a switch valve in order to supply nitrogen gas to a chamber (column 11 lines 1-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Komiyama et al., wherein the controller supplies a process gas when an exhaust

gas is reduced to a predetermined amount in order to monitor completion of a particular process, and to prevent errors in the process by mixing exhaust and process gasses.

3. With regards to claims 19 and 21, Komiyama et al., teach the first exhaust means as a turbo molecular pump, and the second exhaust means as a dry pump (column 10 lines 11-20).
4. With regards to claims 22 and 26, Komiyama et al., teach a first exhaust means connected to a chamber (figure 2 #2b), a second exhaust means connected to the first exhaust means by a pipe (figure 2 #'s 2b and 16), an information acquisition means (column 9 lines 15-18), and a control section (column 9 lines 27-34). Komiyama et al., do not teach the first exhaust section connected to the chamber by an exhaust pipe, nor does he teach the second pipe having a diameter smaller than the first exhaust pipe. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Komiyama et al., with an exhaust pipe connecting the first exhaust means and the chamber in order to gain the advantage of controlling the amount of exhaust gas delivered to the first exhaust means. It also would have been obvious to one of ordinary skill to make the diameter of the second exhaust pipe smaller than the diameter of the first exhaust pipe to gain the advantage of altering the pressure gradient along the tube in order to favor exhaust gas flow into the measuring device.
5. With regards to claims 23 and 27, Komiyama et al., teach a connection between the second exhaust pipe and the measuring section (column 28 lines 36-43, figure 23 #'s 530, X4). Komiyama et al., do not explicitly teach the connection with a pipe, however one of ordinary skill in the art at the time the invention was made would have found it obvious to use any connection means capable of connecting the structures to gain the advantage of measuring the

content of exhaust gases from various sections of the device as taught by Komiyama et al., (column 28 lines 51-58).

6. With regards to claims 24 and 28 Komiyama et al., do not teach a measurement pipe having the same diameter as that of the second exhaust pipe. The MPEP states that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the measurement pipe with a diameter identical to the second exhaust pipe as changes in shape require only routine skill in the art.

7. With regards to claims 25 and 29, Komiyama et al., teach a Fourier-transform infrared spectroscope as the information acquisition means/section (column 9 lines 15-18).

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiyama et al., (US 6,716,477) as applied to claim 6 above, and further in view of Hinaga (US 5,569,837).

9. With regards to claim 12, Komiyama et al., do not teach a process system in which the information acquisition means has a mass spectrometry device. Hinaga teaches a detector for detection of desorption gasses using a mass spectrometer (column 8 line 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Komiyama et al., in view of Hinaga to gain the advantage of measuring desorbed gas with a mass spectrometer in order to reduce the effects of background noise on the gas measurements as taught by Hinaga.

10. Claims 8, 10-12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiyama et al., (US 6,716,477) in view of Kim et al., (US 2003/0185966).

11. With regards to claims 8 and 18, Komiyama et al., teach a process chamber (figure 23 #510), a gas supply (figure 23 #520), a first and second exhaust means (column 10 lines 11-14), a measuring means located between the first and second exhaust means (column 28 lines 36-43, figure 23 #'s 530, X4), and a control means (column 9 lines 27-34). Komiyama et al., do not teach a cleaning means as a component of the device.

Kim et al., teach a substrate processing chamber with a cleaning means for removing residues (abstract, paragraph 0048), and control means. The language regarding the operation is regarded as intended use and is not considered in terms of patentability for the device claims. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Komiyama et al., in view of Kim et al., to gain the advantage of improving chamber performance by preventing or removing accumulation of process residues on the chamber surface as taught by Kim et al.

12. With regards to claim 10, Kim et al., teach the device with a photodiode which reads on the optical counter of the instant claim (paragraph 0061).

13. With regards to claim 11, Kim et al., teach a device capable of detecting byproducts of halogen and silicon reactions which reads on the byproduct measuring means of the instant claim (paragraph 0046).

14. With regards to claim 18, Kim et al., teach a method wherein the magnitude of chemiluminescent signal received from residues on the surface chamber determines an endpoint in the cleaning process (paragraphs 0012, 0013). It would have been obvious to one of ordinary

skill in the art at the time the invention was made to modify Komiyama et al., in view of Kim et al., wherein a predetermined amount of residues initiates cleaning in order to increase the efficiency of substrate processing by not operating a cleaning process after producing a single wafer.

Response to Arguments

15. Applicant's arguments filed August 14, 2008 have been fully considered but they are not persuasive. Applicant has amended the claims to recite functional language for the control means. Komiyama et al., recite a similar mechanism of the control means which renders the amended claims obvious when compared with the prior art. Specifically, the control means of Komiyama et al., controls opening and closing of a switch valve which supplies a chamber with gas which reads on the claimed amendments. In addition, applicant has added language indicating that the control means cleans inside the chamber when the amount of particles reaches a predetermined point. This limitation is rendered obvious when combining references to Komiyama et al., and Kim et al., as cited in this office action. Specifically, Kim et al., teach a cleaning means wherein the magnitude of a signal (predetermined amount) determines when the cleaning process ends which is being read on the limitations introduced into the amended claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwan A. Gerido, Ph.D. whose telephone number is (571)270-3714. The examiner can normally be reached on Monday - Friday, 9:00 - 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lyle A Alexander/
Primary Examiner, Art Unit 1797
DAG